C1.3 Photosynthesis

What the Cell · DP Biology · worksheet · SL statements C1.3.1–8

Name _____ **Date** _____ **Total** _____ / 42

About 45 minutes, or one section at a time. A calculator is allowed. The number of marks shows how many separate points to make.

Section A: Recall

8 marks

1 **Write** the word equation for photosynthesis. C1.3.2 **[2]**

2 **State** the source of the oxygen released in photosynthesis. C1.3.3 **[1]**

3 **State** the two colours of light that chlorophyll absorbs best. C1.3.5 **[2]**

4 **List** three factors that can limit the rate of photosynthesis. C1.3.7 **[3]**

Section B: Understanding

14 marks

5 **Explain** the role of hydrogen from water in photosynthesis. C1.3.2 **[2]**

6 **Explain** how light energy is transformed when a pigment absorbs it. C1.3.5 **[3]**

7 **Distinguish** between an absorption spectrum and an action spectrum. C1.3.6 **[3]**

8 **Explain** what is meant by a limiting factor, using light intensity as an example. C1.3.7 **[3]**

9 **Compare** greenhouse and FACE experiments as ways of predicting future photosynthesis. C1.3.8 **[3]**

Section C: Working with data

14 marks

All data in this section are invented for practice. The patterns are realistic.

10 C1.3.4

A student ran a leaf extract on a thin-layer strip. The solvent moved 75 mm.

Spot	Colour	Distance moved / mm
1	Orange-yellow	72
2	Yellow	48
3	Blue-green	30
4	Yellow-green	18

a **Calculate** Rf for spot 3. **[2]**

b **Identify** the pigment in spot 3, by its colour. **[1]**

c **Suggest** why the spots separate. **[1]**

11 C1.3.6, C1.3.7

Students counted bubbles from pondweed in 5 minutes, with a lamp at different distances.

Distance of lamp / cm	10	20	30	40	50
Bubbles in 5 min	60	60	40	22	14

a **Calculate** the rate at 30 cm, in bubbles per minute. **[1]**

b **Describe** the relationship. **[2]**

c **Explain** why the rate does not rise between 20 cm and 10 cm. **[2]**

d **Suggest** two improvements to this method. **[2]**

e **Describe** how you could vary the concentration of CO_2 in this experiment. **[1]**

f The experiment was repeated with coloured filters. **Predict** the colour that would give the lowest rate, giving a reason. **[2]**

Section D: Longer answer

6 marks

12 **Explain** how the energy in sunlight comes to be stored in glucose. C1.3.1–5 **[6]**